1981

A Russian language speech discrimination test for clinical audiometry

Amy Pearlman

Central Institute for the Deaf

A RUSSIAN LANGUAGE SPEECH DISCRIMINATION TEST FOR CLINICAL AUDIOMETRY

by

Amy E. Pearlman

Independent Study

Supervisors: Dr. R. B. Monsen, Dr. M. W. Skinner

May 1981

Speech audiometry is used routinely in the clinical auditory evaluation, both for assessing auditory reception and speech perception. However, there are different procedures and materials used for obtaining speech discrimination scores and speech reception thresholds.

The speech reception threshold (SRT) is generally obtained using spondaic words in a descending approach. Threshold represents the level at which the subject identifies fifty percent of the spondees. This "serves as an excellent index as to the validity of the threshold response of the listener" (Olsen and Matkin, p. 153); one then examines the relationship between the SRT and pure tone average of 500-2000 Hertz. Should the SRT be greater than 6 dB better than the pure tone average, there is a need for further evaluation: re-instruction and re-check of pure tone thresholds, site of lesion testing, and questioning the presence of a functional hearing loss.

Speech discrimination testing is the "assessment of an individual's ability to understand speech at supra-threshold levels" (Olsen and Matkin, p. 158). The discrimination score provides useful information regarding the individual's hearing loss; this score is evaluated to gain insight into the subject's communicative ability, as well as the determination of possible sites of auditory dysfunction. In addition, speech testing is often used in comparative procedures for hearing aid selection.

Skinner states for discrimination testing the choice of the particular speech material used is dependent upon the individual type and configuration of hearing loss. She recommends using the Rush Hughes or Jerger's phonetically balanced fifty word lists, followed by a second choice of CID W-22 or NU-6 lists. These tests, containing recorded English monosyllables, require the subject to repeat the test word for the examiner.

The use of English monosyllables for speech discrimination evaluation is certainly inappropriate for the testing of individuals who do not speak English. Not only should one be thoroughly familiar with the language and dialect, but the vocabulary must be suited to the individual as well (Davis and Silverman, p. 211).

English speech stimuli represent nonsense syllables for speakers of other languages. This is primarily because English monosyllables are devoid of linguistic information. Secondly, English speech does not represent another language's phonemic structure, for example, English and Russian phonemes are quite different (certain phonemic contrasts between these two languages are later discussed). Nonsense syllables are the most difficult speech stimuli used within the repertoire of discrimination tests. In normal communicative functioning listeners do not need to identify meaningless speech stimuli, therefore a test requiring their recognition is neither an accurate nor reliable representation of one's auditory reception and perception.

Currently there is a need for the development of a Russian Language speech discrimination test due to the large number of Russian immigrants, "New Americans", seen by otologists. To appropriately assess communicative ability within the clinical audiometric

evaluation, this Russian speech discrimination test has been designed to adapt to the Russian language structure and rule system.

One further procedural constraint was to enable the test's administration by an audiologist or individual without prior knowledge of the Russian language. Routinely the patient verbally responds by repeating the test word. In this test the patient would repeat the Russian monosyllable; this response would then be evaluated by the examiner. However, as most Americans are not versed in the Russian language or its phonemic structure, the examiner is not able to appropriately evaluate the responses. Therefore, the format has been changed to a written closed-response task; this enables a recording and scoring method to be used by one unfamiliar with the Russian language. Explicit directions are also provided in Russian prior to the test (See Appendix 1). It is imperative to have a reliable and accurate method of recording and scoring the responses to effectively reduce the variance of a clinical speech test.

A closed-response discrimination test is one in which the listener is provided with a certain set of possibilities, for instance all the choices are printed on the response sheet, and the subject must mark the proper word. There are definite advantages supporting the use of closed-response tasks: (1) permits a ready analysis of errors made by the listener; (2) provides information as to what the individual can and cannot perceive, during his best possible performance in which the response is predictable; (3) and allows the evaluation of receptive language of hearing-impaired individuals with only limited expressive skills (Olsen and Matkin, p. 133-206).

Disadvantages exist for the closed-response tasks as well: (1) often the test is too easy, therefore masking noise or appropriate confusable phonemic choices must be provided; (2) the examiner cannot evaluate the individual's comprehension in an unknown context; (3) there is a definite learning effect unless a large enough stimuli set is used; (4) higher scores are obtained than those on open-response tasks (Olsen and Maktin, pp.133-206).

In light of these facts, this task has been designed to maximize the many advantages of a closed-response test while simultaneously minimizing the possible disadvantages.

The word list is comprised of fifty known Russian monosyllables. It is modelled after Pascoe's "high frequency" list that mainly emphasizes phonemes causing difficulty for hearing-impaired listeners (Pascoe, p. 18). This test does however vary from Pascoe's original design; the main change occurs as a result of the speech containing phonemes representing the Russian language.

There are certain different phonemic structures between Russian and English. Of primary importance in Russian is the distinction of palatalized vs. un-palatalized consonants; most Russian consonants occur as either hard, non-palatalized or soft, palatalized phonemically distinct pairs. The palatalization of a consonant may often be the only distinguishing feature of a word: i.e., КОН [k^hon] (game) vs. КОНЬ [k^hon$_{,}$] (horse). The ($_{,}$) symbol below the phoneme indicates palatalization. "To 'palatalize' a consonant means to pronounce it with the tongue brought close to the hard palate with the acoustic effect of higher pitch" (Stilman, p. 9). English does not have this phonemic palatal quality of hard vs. soft. However, by comparing the initial /k/ sounds of coop and

keep, one finds that the latter approximates the Russian palatalized /k/ with the tongue brought close to the hard palate, in contrast to the former /k/ articulated at the velum.

Although many other similar phonemes are not identical, there is a close correspondence between many Russian and English sounds. Slight changes occur in (1) place of articulation, i.e., for the Russian /t/, the tongue tip touches the upper front, inner surface of the teeth, compared to the English /t/ at the alveolar ridge; (2) manner of articulation, as the Russian phonemes are less aspirated than their English counterparts. In addition, certain Russian sounds are not found in English as the velar fricative х /x/, and the palatal affricate щ /ɕɕ/. As in English, there is the voiced/voiceless distinction for Russian phonemes, i.e., /t/ vs. /d/. In the final position the voiced consonant is neutralized, thus a difference is no longer perceived between the two.

Aside from the change of the phonemic quality of the test words, certain other stimuli configurations were also varied from Pascoe's design, as limited by Russian linguistic constraints. It was was necessary to encorporate four vocalic nuclei (/o/, /i/, /a/, /u/) rather than his original three, to permit a sufficient number of rhyming words and choices within each stimulus foil.

As in the "high frequency" list, phonetic balancing was also neglected, although this Russian list does include a more equal representation of different sounds difficult for the hearing-impaired: voiceless fricatives, /f/, (in тиф [tif]); voiceless plosives, /t/, (in кот [$k^h ot^h$]); various consonant clusters, i.e., /st/, (in кость [$k^h os\overset{h}{t}$]), /ft/, (in лифт [$lift^h$]) and /t ɕ/, (in матч [matɕ]); palatalized consonants. i.e., /$\overset{h}{t}$/, (in рать [rat^h]); nasals

as /m/,(in том[tom]); laterals, /l/, (in холл [xol]); and "r colored vowels" as /or/, (in горн [gorn]) or /ar/,(in марс[mars]).

These phonemes are the final sounds used in the consonant-vowel-consonant (C-V-C) configuration. There are groups of rhyming words that contain identical C-V stems, only varying in the final consonant (see Table 1). This highlights the importance of proper consonant recognition for correct word identification; when the test word is missed, the examiner may then evaluate the error, related to the individual final phoneme.

To increase the difficulty of this closed-response task, whenever possible these fifty foils consist of five phonemically confusable monosyllables, that are "rhyming minimal contrasts". In his development of appropriate foil sets, Griffiths discovered that "listener confusions in manner of articulation, place of articulation and voicing are essentially independent, therefore word sets of minimal contrasts should enhance the diagnostic utility of the test" (Olsen and Matkin, p. 161). The test stimulus differs from the various responses in as few distinctive features as feasible, again as limited by Russian real word constraints; the choices differ in place or manner of articulation, or voicing. Examination of several examples illustrate this point: the test stimulus is кон[k^hon], with the following five possible responses, код [k^hot^h], ком [k^hom], кон [k^hon], конь [k^hon], and кот [k^hot^h]. [k^hot^h] representing both код and кот differs from [k^hon] in manner of articulation and voicing; /t^h/ is a voiceless plosive, whereas /n/ is a nasal resonant. [k^hom] differs from the test stimulus only in place of articulation, /m/ is bilabial, in contrast

Table 1: Alphabetized Russian Monosyllabic Word List, English Transliteration

голь	gol$_{\downarrow}$	ров	rov
гонг	gong	рот	rot^{h}
горн	gorn	суд	sut^{h}
горсть	gors$_{\downarrow\downarrow}$t^{h}	сук	suk^{h}
гость	gos$_{\downarrow\downarrow}$t^{h}	суп	sup^{h}
кокс	koks	суть	sut$_{\downarrow}^{h}$
коль	kol$_{\downarrow}$	сушь	su$_{\int}$
кон	kon	так	tak^{h}
корь	kor$_{\downarrow}$	такт	takt^{h}
кость	kos$_{\downarrow\downarrow}$t^{h}	тальк	talk^{h}
кот	kot^{h}	танк	tank^{h}
ли	li:	тик	tik^{h}
лик	lik	тир	tir
лист	list^{h}	тис	tis
лить	lit$_{\downarrow}^{h}$	тиф	tif
лифт	lift^{h}	тишь	ti$_{\int}$
мазь	mas$_{\downarrow}$	то	to:
марс	mars	ток	tok^{h}
матч	mat$_{\int}^{h}$	толк	tolk^{h}
мать	mat$_{\downarrow}^{h}$	том	tom
мах	max	топь	top$_{\downarrow}^{h}$
рад	rat^{h}	торт	tort^{h}
рант	rant^{h}	холл	xol
рань	ran$_{\downarrow}$	холст	xolst^{h}
рать	rat$_{\downarrow}^{h}$	хоть	xot$_{\downarrow}^{h}$

to the lingua-alveolar /n/. [$k^h o\underset{,}{n}$] also varies only in place of articulation; the Russian palatalized /$\underset{,}{n}$/ (with higher frequency content) is articulated at the palate, rather than the alveolar ridge for /n/.

Another example is рать [$ra\underset{,}{t}^h$], with a palatalized /$\underset{,}{t}$/ to be distinguished from рад [rat^h], раз [ras], рак [rak^h], рант [$rant^h$] and рать [$ra\underset{,}{t}^h$]. [rat^h] represents the /t^h/, articulated at the upper front teeth inner surface, contrasted to the test word's /$\underset{,}{t}$/ at the palate. [ras] with the alveolar fricative /s/ differs from the palatal plosive /$\underset{,}{t}$/. [rak^h] and [$rant^h$] both change the place of articulation, although the latter also interposes a nasal.

These two examples depict the distinctive feature variation included to provide minimal contrasts between the test word and possible responses. However, in reviewing Tables 2 and 3, one notes that several of the test stimuli vary by at least two or more features, for example in manner and place of articulation, from each of the different choices. Whenever feasible, phonemically confusable consonants are employed. However, due to linguistic constraints, (the monosyllable must be a real Russian word), the test word is sometimes only confusable with one or two options. For instance, the test stimulus is хоть[$xo\underset{,}{t}^h$], with ход [xot^h], холл [xol], холст [$xolst^h$], хор [xor], and хоть [$xo\underset{,}{t}^h$] as the alternatives. [xot^h] differs only in the place of articulation; [xol] contains the final /l/ phoneme, a lateral resonant that is clearly distinct from the dental /t/ plosive; [$xolst^h$] interjects a lateral resonant followed by the /st/ consonant cluster; and [xor] contains the /r/ a lingua-palatal resonant. For normally

Table 2: Russian Word List with Foil Alternatives

голь:	гол	голь	голф	гонг	гот
гонг:	год	гонг	голь	горн	гот
горн:	гонг	горб	горн	горсть	гот
горсть:	горб	горн	горсть	гость	гот
гость:	год	горн	горсть	гоєть	гот
кокс:	кок	кокс	кольт	кость	кот
коль:	кол	коль	кольт	конь	корь
кон:	код	ком	кон	конь	кот
корь:	код	кол	коль	кольт	корь
кость:	ковш	кокс	кольт	кость	кот
кот:	кок	кольт	кон	кость	кот
ли:	ли	лик	лист	лиф	лишь
лик:	ли	лик	лист	лить	лифт
лист:	ли	лист	лить	лифт	лишь
лить:	ли	лик	лист	лить	лифт
лифт:	лист	лить	лиф	лифт	лишь
мазь:	мазь	марс	масть	мат	мать
марс:	мазь	марс	март	марш	мат
матч:	марш	мат	матч	мать	мах
мать:	мазь	масть	мат	матч	мать
мах:	мак	мат	матч	мать	мах
рад:	раб	рад	рак	рант	рать
рант:	рад	ранг	рант	рань	рать
рань:	рад	ранг	рант	рань	рать
рать:	рад	раз	рак	рант	рать
ров:	ров	рог	род	рожь	рот
рот:	ров	рог	рожь	рост	рот
суд:	суд	сук	суп	суть	сушь
сук:	суд	сук	суп	суть	сушь
суп:	суд	сук	суп	суть	сушь
суть:	суд	сук	суп	суть	сушь
сушь:	суд	сук	суп	суть	сушь
так:	так	такт	тальк	там	танк
такт:	так	такт	тальк	там	танк
тальк:	так	такт	тальк	там	танк
танк:	так	такт	тальк	там	танк
тик:	тик	тип	тис	тиф	тишь
тир:	тип	тир	тис	тиф	тишь
тис:	тик	тип	тис	тиф	тишь
тиф:	тик	тип	тис	тиф	тишь
тишь:	тик	тип	тис	тиф	тишь
то:	то	ток	тон	топь	тот
ток:	ток	толк	топь	торт	тот
толк:	ток	толк	тон	торт	тот
том:	то	толк	том	тон	топь
топь:	ток	том	тон	топь	тот
торт:	то	торс	торт	торф	тот
холл:	холл	холм	холст	хор	хоть
холст:	ход	холл	холст	хор	хоть
хоть:	ход	холл	холст	хор	хоть

Table 3: Phonetic Transcription of Russian Words and Alternatives

gol:	gol	gol	golf	gong	gont^h
gong:	got^h	gong	gol	gorn	got^h
gorn:	gong	gorb	gorn	gorst^h	got^h
gorst^h:	gorb	gorn	gorst^h	gost^h	got^h
gost^h:	got^h	gorn	gorst^h	gost^h	got^h
koks:	kok^h	koks	kolt	kost^h	kot^h
kol:	kol	kol	kolt^h	kon	kor
kon:	kot^h	kom	kon	kon	kot^h
kor:	kot^h	kol	kol	kolt^h	kor
kost^h:	kovs	koks	kolt^h	kost^h	kot^h
kot^h:	kok^h	kolt^h	kon	kost^h	kot^h
li: :	li:	lik^h	list^h	lif	lis
lik^h:	li:	lik^h	list^h	lit^h	lift^h
list^h:	li:	list^h	lit^h	lift^h	lis
lit^h:	li:	lik^h	list^h	lit^h	lift^h
lift^h:	list^h	lit^h	lif	lift^h	lis
mas:	mas	mars	mast^h	mat^h	mat^h
mars:	mas	mars	mart^h	mars	mat^h
mats:	mars	mat^h	mats^h	mat^h	max
mat^h:	mas	mast^h	mat^h	mats^h	mat^h
max:	mak^h	mat^h	mats^h	mat^h	max
rat^h:	rab	rat^h	rak^h	rant^h	rat^h
rant^h:	rat^h	rang	rant^h	ran	rat^h
ran:	rat^h	rang	rant^h	ran	rat^h
rat^h:	rat^h	ras	rak^h	rant^h	rat^h
rov:	rov	rog	rot^h	roz	rot^h
rot^h:	rov	rog	roz	rost^h	rot^h
sut^h:	sut^h	suk^h	sup^h	sut^h	sus
suk^h:	sut^h	suk^h	sup^h	sut^h	sus
sup^h:	sut^h	suk^h	sup^h	sut^h	sus
sut^h:	sut^h	suk^h	sup^h	sut^h	sus
sus :	sut^h	suk^h	sup^h	sut^h	sus
tak^h:	tak^h	takt^h	talk^h	tam	tank^h
takt^h:	tak^h	takt^h	talk^h	tam	tank^h
talk^h:	tak^h	takt^h	talk^h	tam	tank^h
tank^h:	tak^h	takt^h	talk^h	tam	tank^h
tik^h:	tik^h	tip^h	tis	tif	tis
tir:	tip^h	tir	tis	tif	tis
tis:	tik^h	tip^h	tis	tif	tis
tif:	tik^h	tip^h	tis	tif	tis
tis :	tik^h	tip^h	tis	tif	tis
to:	to:	tok^h	ton	top^h	tot^h
tok^h:	tok^h	tolk^h	top^h	tort^h	tot^h
tolk^h:	tok^h	tolk^h	ton	tort^h	tot^h
tom:	to:	tolk^h	tom	ton	top^h
top^h:	tok^h	tom	ton	top^h	tot^h
tort^h:	to:	tors	tort^h	torf	tot^h
xol:	xol	xolm	xolst^h	xor	xot^h
xolst^h:	xot^h	xol	xolst^h	xor	xot^h
xot^h:	xot^h	xol	xolst^h	xor	xot^h

hearing individuals the choice is basically limited to two options, [xot^h] and [xot$_j^h$]. However, we are concerned with the hearing-impaired subject, for whom auditory capability and processing does not function predictably nor accurately; limitations are imposed by the configuration and type of hearing loss.

As in the "high frequency" word list as well, several test stimuli of a C-V nature, without a final consonant, are included; they also appear as possible responses for many foils. This adds a detection task, as the hearing-impaired individual may not even perceive the presence of a high frequency consonant. Therefore should the subject mark the C-V word as his response, the examiner may then conclude that he did not detect the phoneme. Given the stimuli лик [lik^h] or лить [lit$_j^h$], if the individual responds ли: [li:], one may conclude he did not detect the high frequency consonants, and consequently misidentified the word.

Not only were the test stimuli and task format carefully chosen and arranged, but the recording was done using professional grade equipment and procedures.

The Russian monosyllabic words were recorded by a male native Russian speaker (from Moscow) in an anechoic chamber. He sat facing a special Austrian microphone (1085 AKG, C 451 E), at a distance of 50 cm. from his lips. He controlled his vocal level of the test words within ±5 dB, by watching the sound level meter (Model 1565 A, General Radio) adjacent to the microphone. The stimulus level was simultaneously monitored outside the anechoic chamber, with an oscilloscope (Model 564, Tektronix), an RMS detector comprised of: Storage Display Unit (Model 1921 P2, General Radio), Multifilter One- Third Octave 25 Hz.-20 KHz, (Model 1925, General

Radio), and a Multichannel RMS detector (Model 1926, General Radio), and the loudspeaker (Model AA620, Ampex). This equipment was assembled beside the Nagra Recorder (Model 4.2 L) used for the taping. (See Appendix 2: Block diagram).

Prior to the actual recording, the speaker was given specific instructions and ample opportunity to practice the words; he articulated each at a normal rate,with a normal vocal effort, as though it was the sentence's first or second word. This was done to assure as natural a speech sample as possible.

Two variations of the recordings were made on magnetic tape (Scotch 3M 206 Audio Recording Tape) at 7½ inches per second, on low noise, using the professional grade Nagra magnetic tape recorder. We first recorded three repetitions of a randomized sequence of the test words, (See Appendix 3 for word order on actual test response form)within the frame: "*обведите слова* _____"(you will mark the word_____). Each word was followed by a pause to facilitate segmenting for later re-recording onto the cassettes.

The three repetitions were electro- and psycho-acoustically compared to enable the selection of the most natural sounding Russian speech. It was found that the three samples were nearly identical, and all contained appropriate high frequency energy beyond 12 Khz., as measured by the oscilloscope. The inital recordings of the third set were then re-recorded onto a cassette tape (TDK- Super Avilyn, CrO2 High Bias EQ- 70μs) using another high quality professional recorder (Model M 45, Technics, Direct Drive, 2 Motor SX Head). Examination of the cassette output revealed good preservation of the original input levels, within several decibels.

The reason for the production of this first tape was to facilitate its immediate clinical use, for diagnostic purposes, in addition to gathering some normative data. A second series of repetitions of these same words was recorded using the previously mentioned equipment and procedure. However, this second set was recorded without the carrier phrase, in alphabetical order, but also contained the necessary pause for segmentation; these words, carrier phrase and instructions are to be later re-recorded into Random-Access Programmable Recorder (RAP). Four randomizations of these words will be arranged by the computer, to be subsequently re-taped onto the cassettes.

In conclusion, one readily perceives the overall advantage of this closed-response task. From an evaluation of the subject's responses the examiner makes a ready analysis of errors, providing information about the hearing-impaired individual's speech discrimination, related to the configuration and type of loss. This is crucial for both the diagnostic site of lesion testing as well as for the direction of habilitation/rehabilitation.

Through careful arrangement of the stimulus and foil alternatives, certain closed-response test disadvantages have been reduced. Primarily, the test stimuli and foil responses have been appropriately varied to increase the task's difficulty, thus providing a more accurate estimate of discrimination. Secondly, by using a large set of fifty stimuli words, with five random sequences, any possible learning effect has been minimized.

However, the examiner must account for the remaining disadvan-

tage of testing only within a known context. Normative data must be compiled using this task with native Russian speakers, with normal hearing and various types of hearing-impairment. Future research is also indicated to compute psychometric functions at varying intensity levels and signal-to-noise ratios.

BIBLIOGRAPHY

Akhmanova, O.S., ed. Russian-English Dictionary. Moscow: Russian Language Pulishers, 1975.

Calvert, D.R., and S.R. Silverman. Speech and Deafness. Washington, D.C.: Alexander Graham Bell Association for the Deaf, Inc., 1975.

Davis, H., and S.R. Silverman, ed. Hearing and Deafness, Fourth Edition. New York: Holt, Rinehart, and Winston, 1978, 183-221.

Erber, N.P. "Auditory, visual, and auditory-visual recognition of consonants by children with normal and impaired hearing," J. Speech Hearing Res., 15, (1972), 413-422.

Folomkina, S., and H. Weiser. The Learner's English-Russian Dictionary. Massachusetts: The MIT Press, 1963.

Levitt, H., and S.B. Resnick. "Speech reception by the hearing impaired: Methods of testing and development of new tests," Scandinavian Audiology, Supplement 6, (1978), 107-130.

Olsen, W.O., and N.D. Matkin. "Speech Audiometry", Hearing Assessment, (W.F. Rintelmann, ed.), Baltimore: University Park Press, 1979, 133-206.

Owens, E., M. Benedict, and Schubert, E.D. "Consonant phonemic errors associated with pure-tone configurations and certain kinds of hearing impairment," J. Speech Hearing Res., 15, (1972), 308-322.

Pascoe, D.P. "Frequency response of hearing aids and their effect on the speech perception of hearing-impaired subjects," Ann. Otol., Rhinol., Laryyngol., Supplement 23, 84, (1975), 1-40.

Segal, L. Russian-English and English-Russian Dictionary. New York: Praeger Publishers, 1959.

Skinner, M.W. "Hearing Evaluation and Diagnosis", Class Notes, Speech and Hearing #566, Spring, 1981.

Stilman, G., L. Stilman, W.E. Harkins. Introduction: Russian Grammar. New York: John Wiley & Sons, 1972.

Appendix 1: English Translation of Russian Instructions

Speech Reception Threshold (using English digits as speech stimuli)

Now you will hear English numbers grouped in pairs, for example: 1-6; 9-5; 4-8. You will repeat the numbers that you hear for the specialist administering the test. The speaker's voice will sound softer and softer. Try to guess what numbers were read, even if they were not distinct.

Speech Discrimination Test

Now you will hear fifty words. Each of these appears on your list, in a series of five words, on the paper you received. Please circle with your pencil, from these five, the one that comes closest to the word that you heard.

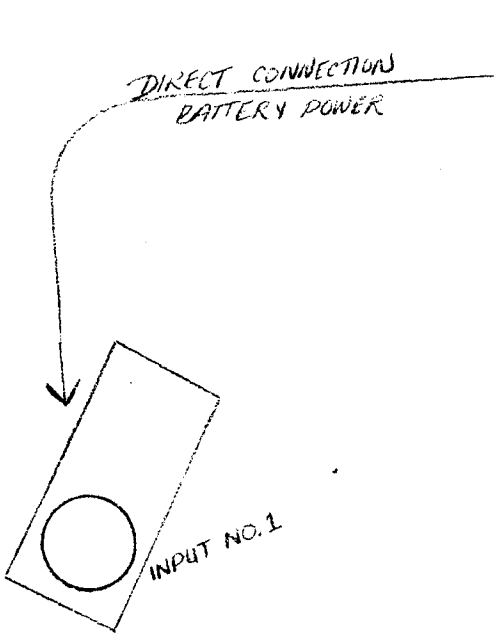
If you hear a windy type noise in one of your ears, please do not pay any attention; continue listening for the words.

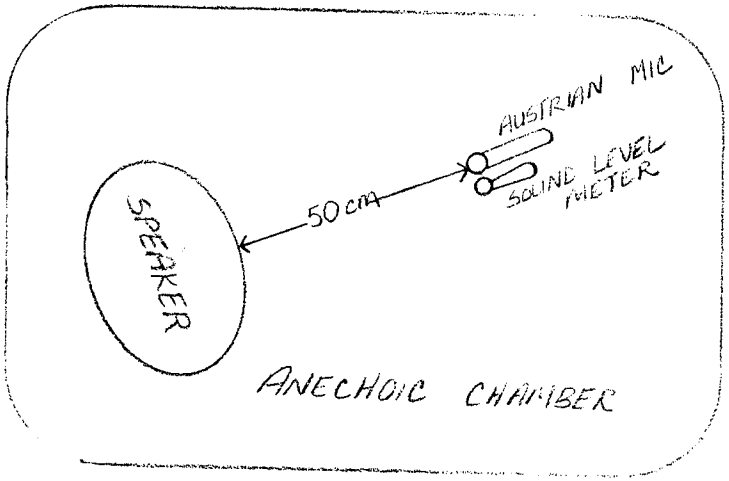
Appendix 1: Russian Instructions

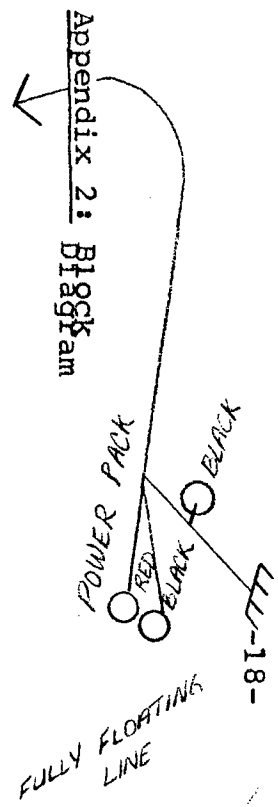
Сейчас вам будет прочитан по английски рад попарно сгруппированних названий цифр, например: I-6; 9-5; 4-8. Вы должны будете повторить услышанние цифры для специалиста проводящего исследование. Голос диктора будет раздаваться все тише и тише. Постарайтесь угадать, какие цифр были названы, даже если вам не удастся отчетливо их расслышать.

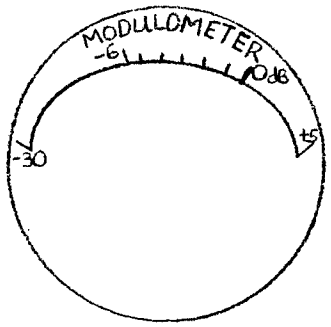
Сейчас вы услышите пятьдесят слов. Каждому из них соответствует строка из пяти слов на виданном вам листе бумаги. Обведите пожалуйста карандашом то из пяти слов, которое по звучанию ближе всего к услышанному.

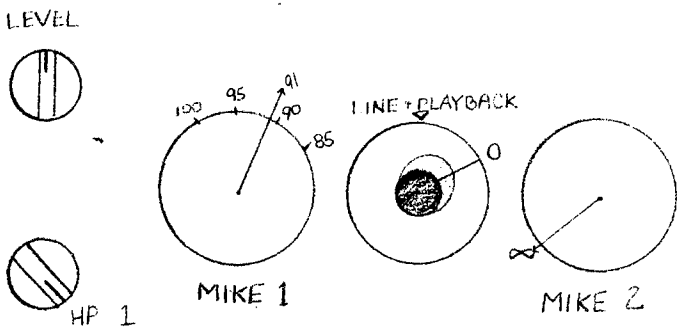
Если вы услшите шум в одном ухе- пожалуйста, не обращайте на него внимания; продолжайте прислушиваться к словам.

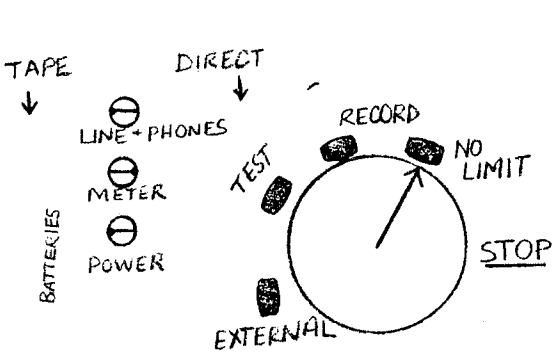












NAGRA RECORDER

[FRONT]

Appendix 3: List A

Список А

1	мазь	масть	мат	матч	мать
2	мазь	марс	март	марш	мат
3	гонг	горб	горн	горсть	гот
4	кол	коль	кольт	конь	корь
5	ход	холл	холст	хор	хоть
6	ров	рог	рожь	рост	рот
7	так	такт	тальк	там	танк
8	кок	кокс	кольт	кость	кот
9	ковш	кокс	кольт	кость	кот
10	мазь	марс	масть	мат	мать
11	суд	сук	суп	суть	сушь
12	ход	холл	холст	хор	хоть
13	мак	мат	матч	мать	мах
14	гол	голь	голф	гонг	гот
15	код	ком	кон	конь	кот
16	ток	том	тон	топь	тот
17	марш	мат	матч	мать	мах
18	тик	тип	тис	тиф	тишь
19	тик	тип	тис	тиф	тишь
20	рад	ранг	рант	рань	рать
21	ли	лик	лист	лить	лифт
22	то	торс	торт	торф	тот
23	ли	лик	лист	лиф	лишь
24	ров	рог	род	рожь	рот
25	лист	лить	лиф	лифт	лишь

Appendix 3 (continued)

[список А]

26	год	гонг	голь	горн	гот
27	то	толк	том	тон	топь
28	раб	рад	рак	рант	рать
29	так	такт	тальк	там	танк
30	ток	толк	топь	торт	тот
31	год	горн	горсть	гость	гот
32	тип	тир	тис	тиф	тишь
33	ли	лист	лить	лифт	лишь
34	кок	кольт	кон	кость	кот
35	суд	сук	суп	суть	сушь
36	рад	раз	рак	рант	рать
37	ли	лик	лист	лить	лифт
38	тик	тип	тис	тиф	тишь
39	так	такт	тальк	там	танк
40	рад	ранг	рант	рань	рать
41	суд	сук	суп	суть	сушь
42	код	кол	коль	кольт	корь
43	то	ток	тон	топь	тот
44	так	такт	тальк	там	танк
45	суд	сук	суп	суть	сушь
46	тик	тип	тис	тиф	тишь
47	холл	холм	холст	хор	хоть
48	суд	сук	суп	суть	сушь
49	ток	толк	тон	торт	тот
50	горб	горн	горсть	гость	гот